

CLAIMS

1. A method for detecting start of a frame, said method comprising:  
processing a received signal with a known preamble to obtain cross-correlation  
5 information for said received signal and said known preamble;  
searching for an indication of strong cross-correlation between said received  
signal and said preamble using said cross-correlation information; and  
registering start of said frame upon detection of said indication.
- 10 2. The method of claim 1 wherein processing said received signal comprises:  
cross-correlating said received signal with said known preamble to develop a  
cross-correlation signal.
- 15 3. The method of claim 2 wherein processing said received signal further comprises:  
filtering said cross-correlation signal.
4. The method of claim 3 wherein filtering said cross-correlation signal comprises:  
cross-correlating said cross-correlation signal with M-1 "0"s and 1 "1" N times  
wherein M is a number of samples in a symbol within said preamble and N is greater than  
20 or equal to 1.
5. The method of claim 2 wherein processing said received signal further comprises:  
non-linearly processing said cross-correlation information prior to said searching.

6. The method of claim 5 wherein non-linearly processing said cross-correlation information comprises:

squaring said cross-correlation signal.

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7. The method of claim 6 further comprising:

filtering said cross-correlation signal.

8. Apparatus for synchronizing to a frame, said apparatus comprising:

10 a cross-correlation system that processes a received signal with a known preamble to obtain cross-correlation information for said received signal and said known preamble; and

15 a synchronization signal generation block that searches for an indication of strong cross-correlation between said received signal and said preamble using said cross-correlation information and provides a synchronization signal responsive to said indication.

9. The apparatus of claim 8 wherein said cross-correlation system cross-correlates said received signal with said known preamble to develop a cross-correlation signal.

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10. The apparatus of claim 9 wherein said cross-correlation system comprises a filter that filters said cross-correlation signal.

11. The apparatus of claim 10 wherein said filter comprises:

a cross-correlation block that cross-correlates said cross-correlation signal with M-1 "0"s and 1 "1" N times wherein M is a number of samples in a symbol within said preamble and N is greater than or equal to 1.

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12. The apparatus of claim 9 wherein said cross-correlation system further comprises:  
a non-linear processing element that non-linearly processes said cross-correlation information.

10 13. The apparatus of claim 12 wherein said non-linear processing element squares said cross-correlation signal.

14. The apparatus of claim 12 further comprising:  
a filter that filters said cross-correlation signal.

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15. Apparatus for detecting start of a frame, said apparatus comprising:  
means for processing a received signal with a known preamble to obtain cross-correlation information for said received signal and said known preamble;  
means for searching for an indication of strong cross-correlation between said  
20 received signal and said preamble using said cross-correlation information; and  
means for registering start of a frame upon detection of said indication.

16. Apparatus for synchronizing to a frame said apparatus comprising:

means for cross-correlating a received signal with a known preamble to obtain cross-correlation information for said received signal and said known preamble;

means for searching for an indication of strong cross-correlation between said  
5 received signal and said preamble using said cross-correlation information and providing a synchronization signal responsive to said indication.

17. A computer program product for detecting start of a frame said product comprising:  
10 code that processes a received signal with a known preamble to obtain cross-correlation information for said received signal and said known preamble;  
code that searches for an indication for a strong cross-correlation between said received signal and said preamble using said cross-correlation information;  
code that registers start said frame upon detection of said indication; and  
15 a computer-readable storage medium that stores the codes.

18. The product of claim 17 wherein said code that processes said received signal comprises:  
code that cross-correlates said received signal with said known preamble to  
20 develop a cross-correlation signal.

19. The product of claim 18 wherein said code that processes said received signal further comprises:  
code that filters said cross-correlation signal.

20. The product of claim 19 wherein said code that filters said cross-correlation signal comprises:

5 code that cross-correlates said cross-correlation signal with M-1 "0"s and 1 "1" N times wherein M is a number of samples in a symbol within said preamble and N is greater than or equal to 1.

10 21. The product of claim 18 wherein said code that processes said received signal further comprises:

code that non-linearly processes said cross-correlation information prior to searching by said code that searches.

15 22. The product of claim 21 wherein said code that non-linearly processes said cross-correlation information comprises:

code that squares said cross-correlation signal.

23. The product of claim 22 further comprising:  
code that filters said cross-correlation signal.

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24. A computer program product for synchronizing to a frame, said computer program product comprising:

code that cross-correlates a received signal with a known preamble to obtain cross-correlation information for said received signal and said known preamble;

code that searches for an indication for a strong cross-correlation between said received signal and said preamble using said cross-correlation information and provides a synchronization signal responsive to said indication; and

5 a computer-readable storage medium that stores the codes.

25. The product of claim 24 wherein said code that cross-correlates comprises code that cross-correlates said received signal with said known preamble to develop a cross-correlation signal.

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26. The product of claim 25 wherein said code that cross-correlates comprises code that filters said cross-correlation signal.

27. The product of claim 26 wherein said code that filter comprises:

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code that cross-correlates said cross-correlation signal with M-1 "0"s and 1 "1" N times wherein M is a number of samples in a symbol within said preamble and N is greater than or equal to 1.

28. The product of claim 25 wherein said code that cross-correlates further comprises:

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code that non-linearly processes said cross-correlation information.

29. The product of claim 28 wherein said code that non-linearly processes said cross-correlation information squares said cross-correlation signal.

30. The product of claim 28 further comprising:  
code that filters said cross-correlation signal.